

Project Title: **Trans Adriatic Pipeline – TAP**

Document Title: **Studio geotecnico e geofisico lungo il tracciato del gasdotto - Italia**

IPL00-URS-000-Q-TRG-0001
Rev.: 00 / all. 08

URS

TAP - Trans Adriatic Pipeline

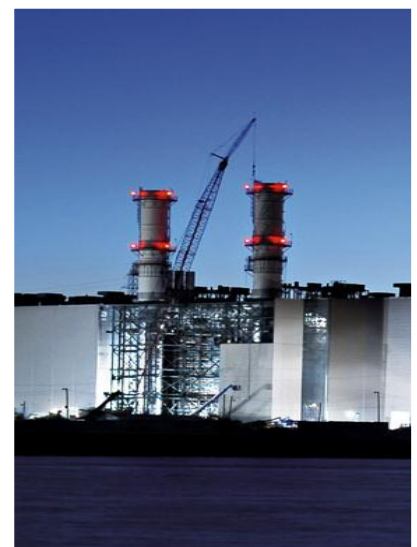
SOIL INVESTIGATION ITALY

Preparato per:
E.ON Technologies GmbH

Luglio, 2015

Studio geotecnico e geofisico lungo il tracciato del gasdotto - Italia

Allegato 8
Colonne stratigrafiche dei sondaggi geotecnici




Project Title: **Trans Adriatic Pipeline – TAP**

Document Title: **Studio geotecnico e geofisico lungo il tracciato del gasdotto - Italia**

IPL00-URS-000-Q-TRG-0001
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PERCORSO DI REDAZIONE / APPROVAZIONE DEL DOCUMENTO

VERSIONE	NOME	FIRMA	DATA	POSIZIONE
Preparato da	A. Passero		Luglio, 2015	Senior Geologist
Controllato da	P. Alesina		Luglio, 2015	Project Manager
Approvato da	G. Lucchini		Luglio, 2015	Technical Director

TITOLO:

STUDIO GEOTECNICO E
GEOFISICO LUNGO IL
TRACCIATO DEL GASDOTTO
(ITALIA)
Allegato 08

Progetto No.
46318-441

Contatto / Cliente:
Florian Guballa

Cliente:

E.ON Technologies GmbH
Alexander-von-Humboldt-Straße 1
45896 Gelsenkirchen

Emesso da:

URS Italia S.p.A.
Via G. Watt, 27
20143 Milano (Italy)

REVISIONI DEL DOCUMENTO

VERSIONE	DATA	Dettagli delle Revisioni
0A	01/07/2015	Bozza per revisioni
0B	15/07/2015	Conclusioni e raccomandazioni
00	31/07/2015	Versione finale


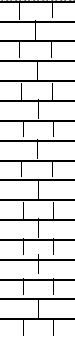
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PROJECT	TAP SOIL INVESTIGATION, ITALY		
LOCATION	MELENDUGNO (LE)	Borehole <input checked="" type="checkbox"/>	Piezometer <input type="checkbox"/>

URS	Site manager: AP	Project no.: 46318-441	Date: April 28, 2015
	Subcontractor: Tecnoin	drilling machine:	Borehole id: BH10
	Drilling method: Rotary coring	Core barrel diameter: 101 mm	Bore diameter: 101 mm

Cumulated depth, m	Lithology	Description	Sample and/or SPT	Core recovery, %					RQD, %					
				0	20	40	60	80	very poor	poor	fair	good	excellent	
0,40		Brown sandy silt.		0	20	40	60	80	very poor	poor	fair	good	excellent	0,0
10,00		Whitish calcarenite, highly fractured. Fractures filled with red silty soil from 1,00 to 5,00 m bgs.		0	20	40	60	80	very poor	poor	fair	good	excellent	2,5 5,0 7,5 10,0
		bottom of the borehole		0	20	40	60	80	very poor	poor	fair	good	excellent	12,5 15,0 17,5 20,0 22,5 25,0 27,5 30,0 32,5 35,0

CLIENT:	E.ON. NEW BUILT & TECHNOLOGIES		
PROJECT	TAP SOIL INVESTIGATION, ITALY		
LOCATION	MELENDUGNO (LE)	Borehole <input checked="" type="checkbox"/>	Piezometer <input type="checkbox"/>

URS	Site manager: AP	Project no.: 46318-441	Date: April 27, 2015
	Subcontractor: Tecnoin	drilling machine:	Borehole id: BH11
	Drilling method: Rotary coring	Core barrel diameter: 101 mm	Bore diameter: 101 mm

Cumulated depth, m	Lithology	Description	Sample and/or SPT	Core recovery, %					RQD, %					
				0	20	40	60	80	very poor	poor	fair	good	excellent	
1,50		Brown sandy silt	SPT 0,50-9,45 (2-1-3) CI (C.D.) 1,30-1,40	0	0	0	0	0	very poor	poor	fair	good	excellent	0,0
10,00		Whitish calcarenite, with variable degree of fracturing.		0	0	0	0	0	very poor	poor	fair	good	excellent	2,5
		bottom of the borehole		0	0	0	0	0	very poor	poor	fair	good	excellent	10,0
				0	0	0	0	0	very poor	poor	fair	good	excellent	12,5
				0	0	0	0	0	very poor	poor	fair	good	excellent	15,0
				0	0	0	0	0	very poor	poor	fair	good	excellent	17,5
				0	0	0	0	0	very poor	poor	fair	good	excellent	20,0
				0	0	0	0	0	very poor	poor	fair	good	excellent	22,5
				0	0	0	0	0	very poor	poor	fair	good	excellent	25,0
				0	0	0	0	0	very poor	poor	fair	good	excellent	27,5
				0	0	0	0	0	very poor	poor	fair	good	excellent	30,0
				0	0	0	0	0	very poor	poor	fair	good	excellent	32,5
				0	0	0	0	0	very poor	poor	fair	good	excellent	35,0

CLIENT:	E.ON. NEW BUILT & TECHNOLOGIES		
PROJECT	TAP SOIL INVESTIGATION, ITALY		
LOCATION	MELENDUGNO (LE)	Borehole <input checked="" type="checkbox"/>	Piezometer <input type="checkbox"/>

URS	Site manager: AP	Project no.: 46318-441	Date: from april 23 to 24, 2015
	Subcontractor: Tecnoin	drilling machine:	Borehole id: BH11bis
	Drilling method: Rotary coring	Core barrel diameter: 101 mm	Bore diameter: 101 mm

Cumulated depth, m	Lithology	Description	Sample and/or SPT	Core recovery, %					RQD, %					
				0	20	40	60	80	very poor	poor	fair	good	excellent	
0,40		Brown sandy silt.												0,0
10,00		Whitish calcarenite, from very to low fractured												2,5
														5,0
														7,5
														10,0
		bottom of the borehole												12,5
														15,0
														17,5
														20,0
														22,5
														25,0
														27,5
														30,0
														32,5
														35,0

CLIENT:	E.ON. NEW BUILT & TECHNOLOGIES		
PROJECT	TAP SOIL INVESTIGATION, ITALY		
LOCATION	MELENDUGNO (LE)	Borehole <input checked="" type="checkbox"/>	Piezometer <input type="checkbox"/>

URS	Site manager: AP	Project no.: 46318-441	Date: from april 22 to 23, 2015
	Subcontractor: Tecnoin	drilling machine:	Borehole id: BH11ter
	Drilling method: Rotary coring	Core barrel diameter: 101 mm	Bore diameter: 101 mm


Cumulated depth, m	Lithology	Description	Sample and/or SPT	Core recovery, %					RQD, %					
				0	20	40	60	80	very poor	poor	fair	good	excellent	
0,70		Brown sandy silt.	0,50 15-REF 0,95											0,0
10,00		Whitish calcarenite, from very to low fractured												2,5
														5,0
														7,5
														10,0
		bottom of the borehole												12,5
														15,0
														17,5
														20,0
														22,5
														25,0
														27,5
														30,0
														32,5
														35,0


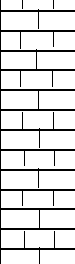

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PROJECT	TAP SOIL INVESTIGATION, ITALY		
LOCATION	MELENDUGNO (LE)	Borehole <input checked="" type="checkbox"/>	Piezometer <input type="checkbox"/>

URS	Site manager: AP	Project no.: 46318-441	Date: from april 21 to 22, 2015
	Subcontractor: Tecnoin	drilling machine:	Borehole id: BH1Bbis
	Drilling method: Rotary coring	Core barrel diameter: 101 mm	Bore diameter: 101 mm


Cumulated depth, m	Lithology	Description	Sample and/or SPT	Core recovery, %					RQD, %					
				0	20	40	60	80	very poor	poor	fair	good	excellent	
0,60		Brown sandy silt.		0	20	40	60	80	very poor	poor	fair	good	excellent	0,0
10,00		Whitish calcarenite, from low to very fractured		0	20	40	60	80	very poor	poor	fair	good	excellent	2,5
		bottom of the borehole		0	20	40	60	80	very poor	poor	fair	good	excellent	10,0
				0	20	40	60	80	very poor	poor	fair	good	excellent	12,5
				0	20	40	60	80	very poor	poor	fair	good	excellent	15,0
				0	20	40	60	80	very poor	poor	fair	good	excellent	17,5
				0	20	40	60	80	very poor	poor	fair	good	excellent	20,0
				0	20	40	60	80	very poor	poor	fair	good	excellent	22,5
				0	20	40	60	80	very poor	poor	fair	good	excellent	25,0
				0	20	40	60	80	very poor	poor	fair	good	excellent	27,5
				0	20	40	60	80	very poor	poor	fair	good	excellent	30,0
				0	20	40	60	80	very poor	poor	fair	good	excellent	32,5
				0	20	40	60	80	very poor	poor	fair	good	excellent	35,0

CLIENT:	E.ON. NEW BUILT & TECHNOLOGIES		
PROJECT	TAP SOIL INVESTIGATION, ITALY		
LOCATION	MELENDUGNO (LE)	Borehole <input checked="" type="checkbox"/>	Piezometer <input type="checkbox"/>

	Site manager: AP	Project no.: 46318-441	Date: april 22, 2015
	Subcontractor: Tecnoin	drilling machine:	Borehole id: BH1B
	Drilling method: Rotary coring	Core barrel diameter: 101 mm	Bore diameter: 101 mm


Cumulated depth, m	Lithology	Description	Sample and/or SPT	Core recovery, %					RQD, %					
				0	20	40	60	80	very poor	poor	fair	good	excellent	
0,65		Brown sandy silt.	0,50 REF 0,95											0,0
7,50		Whitish calcarenite, from low to very fractured. Cavity from 7,50 to 8,00 m bgs.	SPT											2,5
8,00														5,0
10,00														7,5
		bottom of the borehole												10,0
														12,5
														15,0
														17,5
														20,0
														22,5
														25,0
														27,5
														30,0
														32,5
														35,0




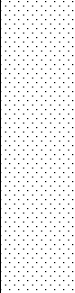
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PROJECT	TAP SOIL INVESTIGATION, ITALY		
LOCATION	MELENDUGNO (LE)	Borehole <input checked="" type="checkbox"/>	Piezometer <input type="checkbox"/>

	Site manager: AP	Project no.: 46318-441	Date: from april 20 to 21, 2015
	Subcontractor: Tecnoin	drilling machine:	Borehole id: BH1Bter
	Drilling method: Rotary coring	Core barrel diameter: 101 mm	Bore diameter: 101 mm


Cumulated depth, m	Lithology	Description	Sample and/or SPT	Core recovery, %					RQD, %					
				0	20	40	60	80	very poor	poor	fair	good	excellent	
0.50		Brown sandy silt.												
0.80		Yellowish coarse, porous, calcarenite, very fractured and weathered.	from 0,80 to 1,20											
1.70		Reddish silty clayey.	D.S. Cl											
3.60		Whitish weakly clayey silt with calcareous clasts and/or pebbles; level of green silty clay from 2,20 to 2,50 m bgs.												2.5
5.00		Reddish to light orange sandy silt with clasts and pebbles.	from 4,50 to 5,00 U.S. Cl											5.0
7.20		Whitish calcarenite with high degree of fracturing and presence of cavities (7,2-7,6 m bgs, 7,7-8,3 bgs, 9,00-9,30 bgs)												7.5
7.60														
7.70														
8.30														
9.00														
9.30														
10.00		bottom of the borehole												10.0
														12.5
														15.0
														17.5
														20.0
														22.5
														25.0
														27.5
														30.0
														32.5
														35.0

CLIENT:	E.ON. NEW BUILT & TECHNOLOGIES		
PROJECT	TAP SOIL INVESTIGATION, ITALY		
LOCATION	MELENDUGNO (LE)	Borehole <input checked="" type="checkbox"/>	Piezometer <input type="checkbox"/>

	Site manager: AP	Project no.: 46318-441	Date: May 14, 2015
	Subcontractor: Tecnoin	drilling machine:	Borehole id: BH4
	Drilling method: Rotary coring	Core barrel diameter: 101 mm	Bore diameter: 101 mm

Cumulated depth, m	Lithology	Description	Sample and/or SPT	Core recovery, %					RQD, %					
				0	20	40	60	80	very poor	poor	fair	good	excellent	
0,10		Brown sandy silt												0,0
0,60		Yellowish sand												
2,40		Yellowish calcarenite												2,5
6,52	 groundwater level	Yellowish sand	3,50-4,00 m bgs U.S. C1 4,00-4,45 m bgs D.S. C2 SPT1 4-5-7 6,50-6,95 m bgs D.S. C2 SPT2 8-18-20											7,5
10,00		bottom of the borehole												10,0
		Lefranc tests at -4,00±-5,00 and -9,00±-10,00 m bgs												12,5
														15,0
														17,5
														20,0
														22,5
														25,0
														27,5
														30,0
														32,5
														35,0

CLIENT:	E.ON. NEW BUILT & TECHNOLOGIES		
PROJECT	TAP SOIL INVESTIGATION, ITALY		
LOCATION	MELENDUGNO (LE)	Borehole <input checked="" type="checkbox"/>	Piezometer <input type="checkbox"/>

	Site manager: AP	Project no.: 46318-441	Date: April 30, 2015
	Subcontractor: Tecnoin	drilling machine:	Borehole id: BH5
	Drilling method: Rotary coring	Core barrel diameter: 101 mm	Bore diameter: 101 mm

Cumulated depth, m	Lithology	Description	Sample and/or SPT	Core recovery, %					RQD, %					
				0	20	40	60	80	very poor	poor	fair	good	excellent	
0,20		Brown sandy silt												0,0
1,80		Yellowish calcarenite, very fractured												
			SPT1 1,00-1,45 Ref											2,5
			from 2,80 to 3,40 U.S. C1											5,0
		Yellowish sand, with clasts variable in size from 6,00 to 8,00 m bgs												7,5
7,00			SPT2 7,00-7,45 22-Ref											10,0
		bottom of the borehole												12,5
														15,0
														17,5
														20,0
														22,5
														25,0
														27,5
														30,0
														32,5
														35,0







CLIENT:	E.ON. NEW BUILT & TECHNOLOGIES		
PROJECT	TAP SOIL INVESTIGATION, ITALY		
LOCATION	MELENDUGNO (LE)	Borehole <input checked="" type="checkbox"/>	Piezometer <input type="checkbox"/>

URS	Site manager: AP	Project no.: 46318-441	Date: April 29 to 30, 2015
	Subcontractor: Tecnoin	drilling machine:	Borehole id: BH6
	Drilling method: Rotary coring	Core barrel diameter: 101 mm	Bore diameter: 101 mm


Cumulated depth, m	Lithology	Description	Sample and/or SPT	Core recovery, %					RQD, %					
				0	20	40	60	80	very poor	poor	fair	good	excellent	
0,20		Brown sandy silt												0,0
5,00		Yellowish calcareous sand	SPT1 1,00-1,45 32-40-Ref SPT2 2,80-3,25 29-33-37 from 6,00 to 6,40 U.S. C1 7,00-7,45 8-12-12 SPT3 + C2											2,5
10,00		bottom of the borehole												10,0
														12,5
														15,0
														17,5
														20,0
														22,5
														25,0
														27,5
														30,0
														32,5
														35,0


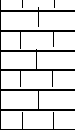

CLIENT:	E.ON. NEW BUILT & TECHNOLOGIES		
PROJECT	TAP SOIL INVESTIGATION, ITALY		
LOCATION	MELENDUGNO (LE)	Borehole <input checked="" type="checkbox"/>	Piezometer <input type="checkbox"/>

	Site manager: AP	Project no.: 46318-441	Date: April 29, 2015
	Subcontractor: Tecnoin	drilling machine:	Borehole id: BH7
	Drilling method: Rotary coring	Core barrel diameter: 101 mm	Bore diameter: 101 mm


Cumulated depth, m	Lithology	Description	Sample and/or SPT	Core recovery, %					RQD, %					
				0	20	40	60	80	very poor	poor	fair	good	excellent	
0,60		Brown sandy silt												0,0
2,60		Yellowish calcarenite, porous, very fractured												2,5
7,00	 groundwater level	Yellowish calcareous sand, becoming denser downward.	from 3,00 to 3,50 U.S. C1											5,0
10,00			from 7,00 to 7,40 D.S. C2											7,5
		bottom of the borehole												10,0
														12,5
														15,0
														17,5
														20,0
														22,5
														25,0
														27,5
														30,0
														32,5
														35,0


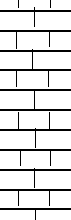
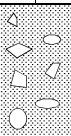
CLIENT:	E.ON. NEW BUILT & TECHNOLOGIES		
PROJECT	TAP SOIL INVESTIGATION, ITALY		
LOCATION	MELENDUGNO (LE)	Borehole <input checked="" type="checkbox"/>	Piezometer <input type="checkbox"/>

	Site manager: AP	Project no.: 46318-441	Date: April 28, 2015
	Subcontractor: Tecnoin	drilling machine:	Borehole id: BH9
	Drilling method: Rotary coring	Core barrel diameter:	Bore diameter:

Cumulated depth, m	Lithology	Description	Sample and/or SPT	Core recovery, %					RQD, %					
				0	20	40	60	80	very poor	poor	fair	good	excellent	
0,40		Brown sandy silt												0,0
4,00		Yellowish calcarenite, porous, highly fractured.												2,5
10,00		Yellowish sand	from 6,00 to 6,40 D.S. C1											7,5
		bottom of the borehole												10,0
														12,5
														15,0
														17,5
														20,0
														22,5
														25,0
														27,5
														30,0
														32,5
														35,0

CLIENT:	E.ON. NEW BUILT & TECHNOLOGIES		
PROJECT	TAP SOIL INVESTIGATION, ITALY		
LOCATION	MELENDUGNO (LE)	Borehole <input checked="" type="checkbox"/>	Piezometer <input type="checkbox"/>

	Site manager: AP	Project no.: 46318-441	Date: April 28, 2015
	Subcontractor: Tecnoin	drilling machine:	Borehole id: BH9bis
	Drilling method: Rotary coring	Core barrel diameter: 101 mm	Bore diameter: 101 mm

Cumulated depth, m	Lithology	Description	Sample and/or SPT	Core recovery, %					RQD, %					
				0	20	40	60	80	very poor	poor	fair	good	excellent	
0,20		Brown sandy silt												0,0
6,50		Yellowish calcarenite, porous, highly fractured.												2,5
7,50			from 7,00 to 7,50 U.S. C1											7,5
10,00		Brown clayey silt with clasts variable in size.												10,0
		bottom of the borehole												12,5
														15,0
														17,5
														20,0
														22,5
														25,0
														27,5
														30,0
														32,5
														35,0

CLIENT:	E.ON. NEW BUILT & TECHNOLOGIES		
PROJECT	TAP SOIL INVESTIGATION, ITALY		
LOCATION	MELENDUGNO (LE)	Borehole <input checked="" type="checkbox"/>	Piezometer <input type="checkbox"/>

URS	Site manager: AP	Project no.: 46318-441	Date: April 28, 2015
	Subcontractor: Tecnoin	drilling machine:	Borehole id: BH9ter
	Drilling method: Rotary coring	Core barrel diameter: 101 mm	Bore diameter: 101 mm

Cumulated depth, m	Lithology	Description	Sample and/or SPT	Core recovery, %					RQD, %					
				0	20	40	60	80	very poor	poor	fair	good	excellent	
0,30		Brown sandy silt		0	20	40	60	80	very poor	poor	fair	good	excellent	0,0
		Whitish calcarenite, with low degree of fracturing.												2,5
														5,0
														7,5
10,00														10,0
		bottom of the borehole												12,5
														15,0
														17,5
														20,0
														22,5
														25,0
														27,5
														30,0
														32,5
														35,0

CLIENT:	E.ON. NEW BUILT & TECHNOLOGIES			
PROJECT	TAP SOIL INVESTIGATION, ITALY			
LOCATION	MELENDUGNO (LE)	Borehole <input checked="" type="checkbox"/>	Piezometer <input checked="" type="checkbox"/>	

URS	Site manager: AP	Project no.: 46318-441	Date: May 7-8 and 27, 2015
	Subcontractor: Tecnoin	drilling machine:	Borehole id: ST_BH1 / Piezo 6
	Drilling method: Rotary coring	Core barrel diameter: 101 mm	Bore diameter: 101 mm (alesaggio a 127 mm)

Cumulated depth, m	Lithology	Description	Sample and/or SPT	Core recovery, %					RQD, %					
				0	20	40	60	80	very poor	poor	fair	good	excellent	
0.40		Brown sandy silt												0.0
2.30		Yellowish calcarenite, porous, very fractured	1,60-2,00 C1											2.5
3.00		Yellowish sand	3,00-3,50 U.S. C2											5.0
7.50		Yellowish sand	4,00-4,50 D.S. C3											7.5
10.00		Whitish silty sand	6,00-6,45 D.S. C4 SPT1 7-14-32											10.0
11.00		Core destruction drilling from 10,00 to 11,00 m bgs bottom of the borehole	9,00-9,45 SPT2 6-6-12											12.5
		Lefranc tests at -4,00÷-5,00 and -9,50÷-10,00 m bgs												15.0
														17.5
														20.0
														22.5
														25.0
														27.5
														30.0
														32.5
														35.0

